CHAPTER 12

FLASHINGS AND APPURTENANCES

Section I. WALL, CHIMNEY, AND MONITOR FLASHINGS

12.1.1 General Discussion

12.1.1.1 Function and Usual Causes of Failure. The function of a flashing is to provide a water-tight junction between the roofing material and other parts of the structure, and between roof sections (fig. 47). Flashings are the most vulnerable part of any roof since the majority of leaks result from failures at these vital areas. There are numerous causes of flashing failures, the most common resulting from inadequate or faulty construction. Many roof and flashing failures could be eliminated by constant and painstaking inspection by competent inspectors during installation. Some common causes of flashing failures are:

(1) Weathering resulting from insufficient or lack of protective coating.

(2) Punctures usually resulting from the omission of a cant strip (fig. 48).

(3) Open laps or seams (fig. 49).

(4) Separation of flashings from vertical surface.

(5) No allowance made for expansion and contraction of metal flashings.

(6) Damage by personnel having access to roofs.

12.1.1.2 Other Considerations. In many instances, leaks have been attributed to flashing failures where no such failures were evident. The actual cause may result from open joints in a masonry wall or chimney, into which the water enters, works its way down behind the flashing and into the roofing. In masonry walls, this condition may be eliminated by "through the wall" flashings.

12.1.1.2.1 Classes. Flashings may be differentiated into two main classes, namely, base and cap or counter flashing.

(1) *Base Flashing.* The base flashing is the actual junction between the roofing material and the vertical wall, projection, etc., and should be considered as a component part of the roof construction. Metal base flashing is generally used with shingled roofs. The base flashing for built-up roofing should be of a bituminous nature. Metal base flashing is not recommended for built-up roofs.

(2) *Cap or Counter Flashing.* The cap or counter flashing is usually constructed of metal and serves as a protecting cover for the base flashing. This flashing should extend a minimum of 8 inches and a maximum of 16 inches above the roof line and should be set into a reglet extending into the wall at least 1⅛ inches. Through-wall flashings are preferred to reglets which extend only part way into the wall. The function of the cap or counter flashing is to protect the base flashing so that all flashing strips and nails are completely covered. In isolated instances, a cap flashing of felt or fabric is employed. This system usually consists of a 4 to 6 inch strip of saturated felt or fabric, embedded in plastic cement and placed 2 to 3 inches above and 2 to 3 inches below the top edge of the base flashing so that all nail heads are completely covered. A uniform coating of a plastic flashing cement is then troweled to a feather edge over the felt or fabric strip. The felt or fabric cap flashing should be frequently inspected as it is more susceptible to weathering than the metal cap flashing. Surface-mounted reglets are available for use on existing walls not having a built-in reglet. The tops of such reglets are generally sealed with an elastomeric sealant.

12.1.2 Flashing Failures

For convenience, the inspection form for flashings is incorporated with the inspection forms for various types of roofing in appendix G.

12.1.2.1 Base Flashings. Numerous failures attributed to the roofing material are frequently flashing failures. These areas should be the first to be inspected when leaks in a structure are reported. A good procedure to follow is to first make a careful inspection of the roofing material near the flashings for signs of breaks or of moisture. In built-up roofs, blisters in this area are an indication that moisture has found its way beneath the membrane. When blisters are evident and the mem

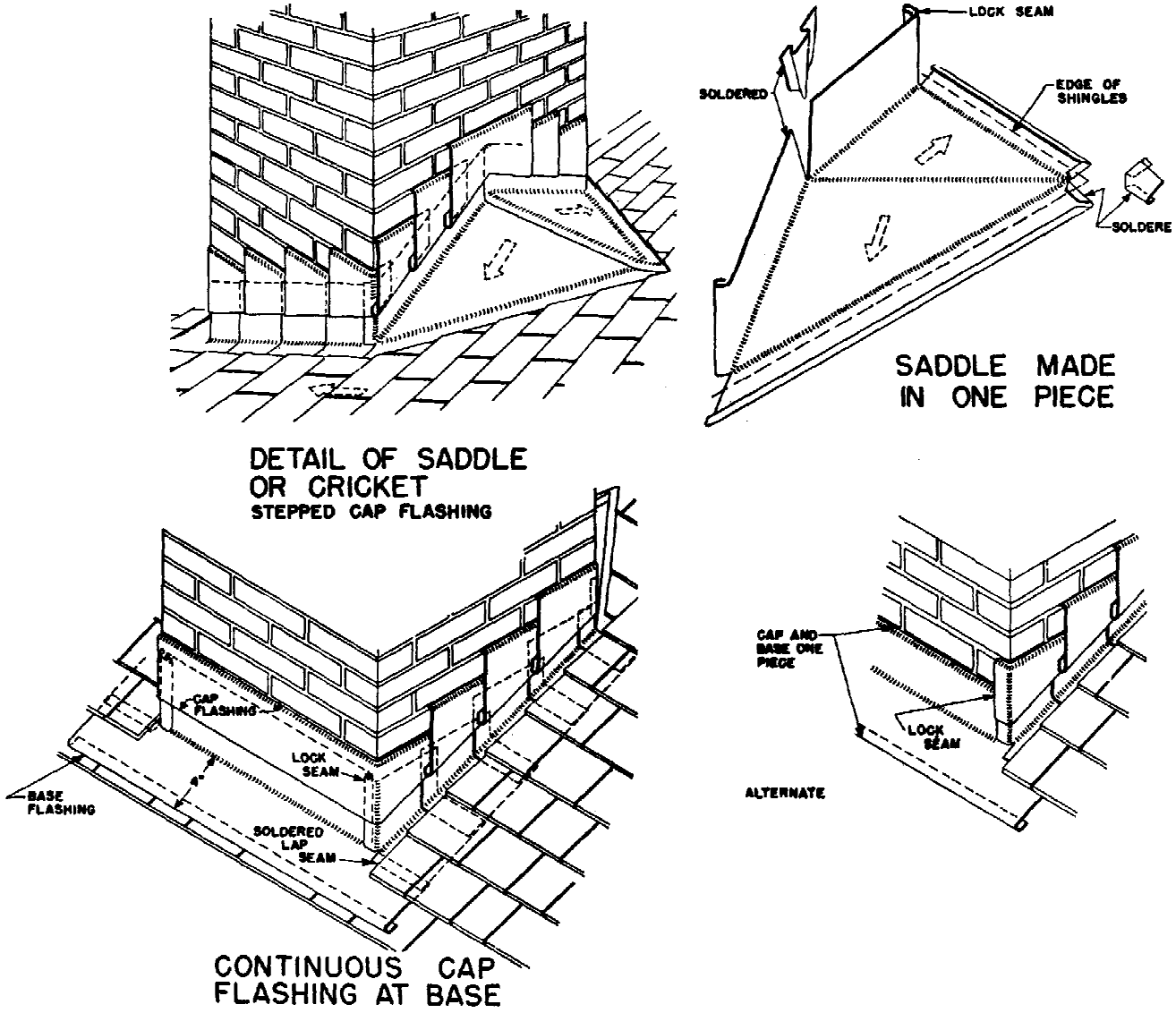

Figure 47. Typical details of chimney flashings.

brane seems intact, a flashing failure is indicated. Punctures, broken laps or seams, separation of flashing from vertical surfaces and deterioration from weather are causes of failure. Flashings that face the sun deteriorate more rapidly. If a cant strip is present, it can usually be detected by gently tapping the flashing with a solid object in the area mid-way between the roof and the vertical surface. The areas in question should be clearly marked for future maintenance and repair.

12.1.2.2 Metal Base Flashings. Although the use of metal base flashings in the construction of built-up roofs is not recommended, they are sometimes used. The common failures which occur in a metal base flashing are separation at interface with bituminous materials, cracks, broken joints, and deterioration of ferrous metal flashing due to lack of protective covering. The inspector should pay particular attention to exterior and interior corners, which areas are most vulnerable. Usually no cant strip is employed when base flashing is of metal.

12.1.2.3 Bituminous Cap or Counter Flashings. The most likely causes of failure of bituminous cap flashings are—

(1) Separation of flashing from the vertical surface and/or from base flashing.

(2) Deterioration due to lack of protective coating.

(3) Too heavy application of or use of unsuitable bituminous or plastic cement causing sluffing.

12.1.2.4 Metal Cap or Counter Flashings. The common failures in metal cap flashings are—

(1) Location of the flashing too high or too low above the roof deck.

(2) Deterioration of ferrous cap flashings resulting from the lack of paint.

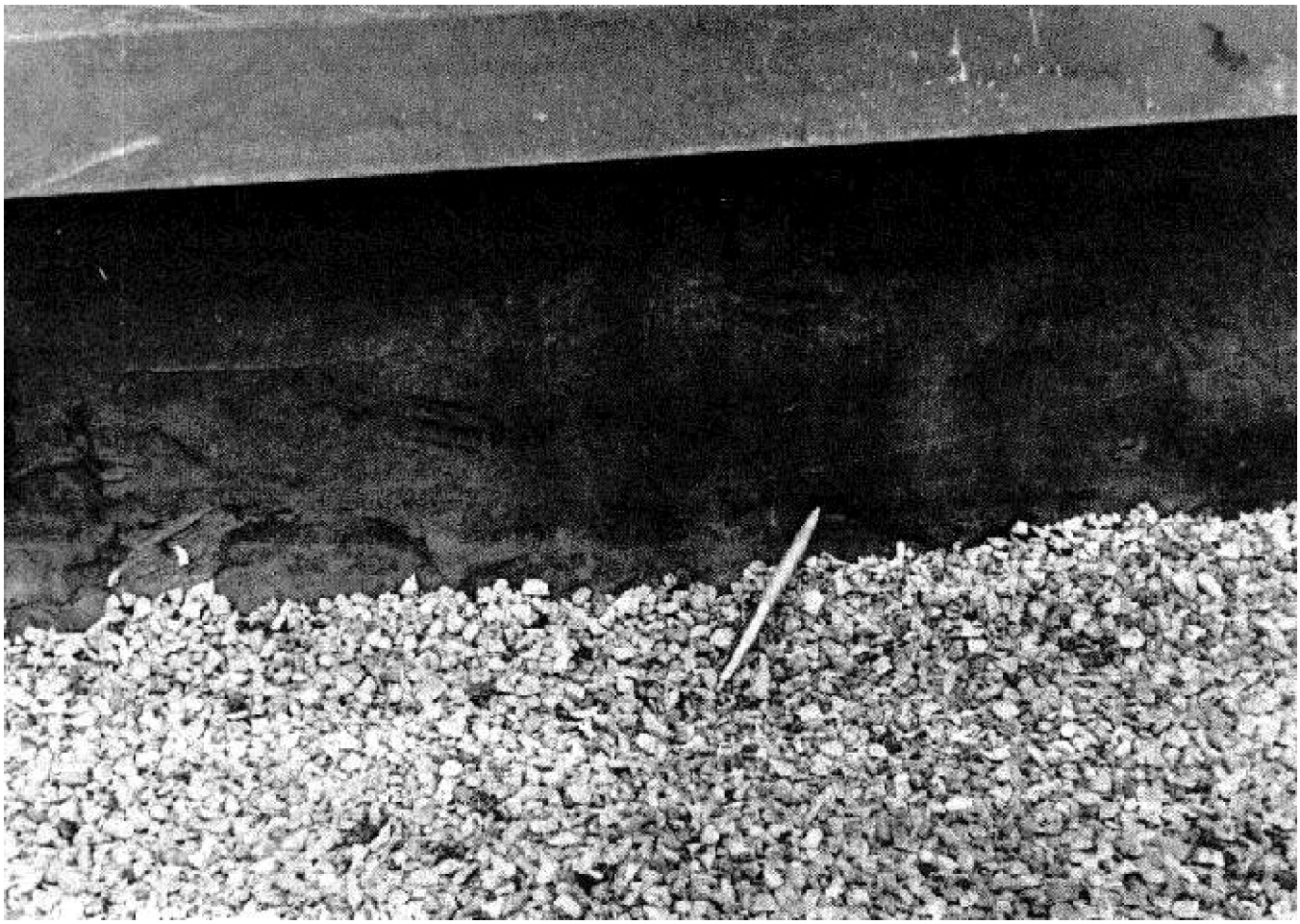

Figure 48. Puncture resulting from lack of cant strip.

(3) Cracks and broken joints due to expansion and contraction.

(4) Separation of the flashing from the vertical surface.

(5) Reglet not sealed.

(6) Inadequate lap of cap flashing over base flashing permitting entrance of wind-driven rain.

(7) Cap flashing does not hug tightly to base flashing.

12.1.3 Maintenance and Repair Methods

In any discussion of flashings, no distinction can be drawn between maintenance and repair methods. Consequently, the two are combined in this section.

12.1.3.1 Bituminous Base Flashings.

12.1.3.1.1 Punctures. Punctures (fig. 48) are usually caused by traffic or by falling objects striking a base flashing where a cant strip has been omitted. For temporary repair, make puncture watertight by coating with asphalt plastic flashing cement, embedding into the cement a saturated felt or fabric, and applying with a trowel a coat of plastic flashing cement. For permanent repair, remove the broken flashing, install a cant strip and reflash in accordance with standard specifications for new roof construction.

12.1.3.1.2 Vertical Laps of Flashing Open. To make repairs when vertical laps of flashing are open, smooth laps back in place and recement with plastic flashing cement. Recoat entire lap with plastic flashing cement.

12.1.3.1.3 Separation or Sagging of Base Flashing from Wall, Chimney or Monitor. If separation occurs between the base flashing and a wall, chimney, or monitor, refasten the base flashing to the vertical surface by nailing or cementing. Recoat with a plastic flashing cement and replace appropriate counter flashing.

12.1.3.1.4 Surface Coating of Plastic Base Flashing Disintegrated. If the surface coating of a plastic base flashing has disintegrated, brush off all loosely adhering coating and apply a trowel coating of asphalt plastic cement.

12.1.3.2 Metal Base Flashings.

12.1.3.2.1 Lack of Protective Coating or Paint—Metal Not Severely Deteriorated. If the

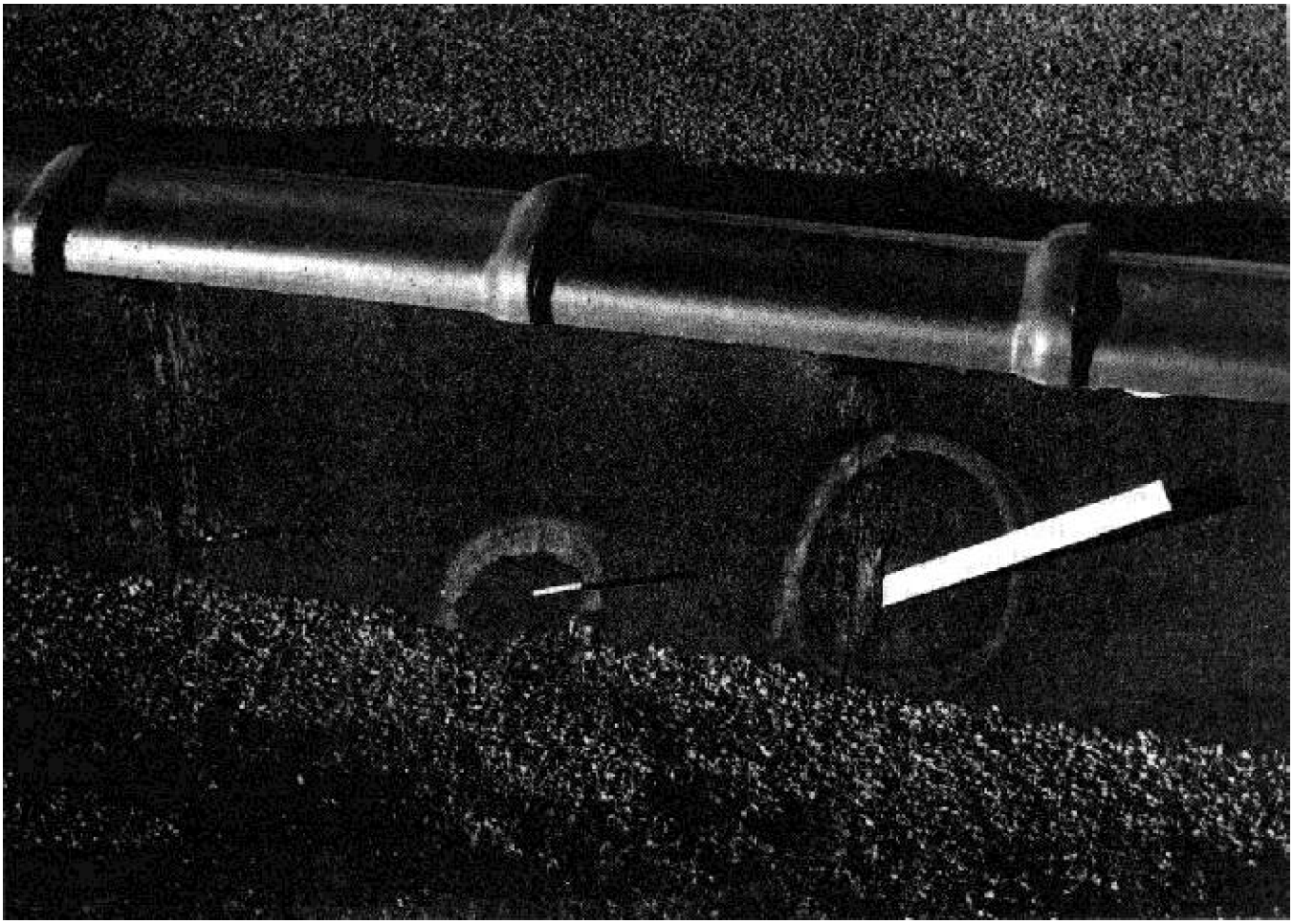

Figure 49. Open laps and split in base flashing..

protective coating of paint on metal base flashing has deteriorated but the metal itself is not severely damaged, remove all rust, moisture, loose scale, grease, dirt, etc., and apply fresh coating of paint. Instructions for painting metal are given in the tri-services paint manual.

12.1.3.2.2 Lack of Protective Coating Of Paint—Metal Severely Deteriorated i.e., Holes, Punctures. If the metal has deteriorated to the extent that there are holes *or* punctures, remove and discard deteriorated area of flashings and replace in kind. If membrane is being replaced, provide cant strips and use bituminous base flashing in lieu of metal base flashings.

12.1.3.2.3 Vertical Joints of Base Flashing Open. When the vertical joints of metal base flashings are open, straighten the metal flashing and put it in place. Resolder open joints. Install additional expansion joints where necessary.

12.1.3.2.4 Separation of Metal *Base Flashing from Wall, Chimney or Monitor*. If metal base flashing is separated from wall, chimney, or monitor, treat as described under maintenance and repair of plastic base flashings, paragraph 12.1.3.1.3.

12.1.3.3 Bituminous Cap or Counter Flashings.

12.1.3.3.1 Separation of Bituminous Cap Flashing from Vertical Wall and/or Base Flash Flashing. If a separation occurs between the cap flashing and the vertical wall and/or the base flashing, recement the cap flashing with a plastic flashing cement and apply a trowel coat of flashing cement.

12.1.3.3.2 Deterioration Caused by Lack of Protective Coating. If the cap or counter flashing has deteriorated owing to the absence of a protective coating, brush off all loosely adhering coating and apply a trowel coating of plasic flashing cement.

12.1.3.4 Metal Cap Flashings.

12.1.3.4.1 Lack of Protective Coating of Paint—Metal Not Severely Deteriorated. If the protective coating of paint on metal cap flashings has deteriorated but the material itself is not severely damaged, remove all rust, moisture, loose scale, grease, and dirt and apply a fresh coating of paint. Instructions for painting are given in the tn-services paint manual.

12.1.3.4.2 Lack of Protective Coating of Paint—Metal Severely Deteriorated. If the metal cap flashings are deteriorated to the extent that there are holes or punctures, remove and discard the deteriorated area of flashings and reflash in accordance with standard specifications for new construction.

12.1.3.4.3 Metal Cap Flashing Located Too High or Too Low to Function Properly. When the metal cap flashing is located too high or too low to function properly, remove the loose flashing and trim off flush with the wall any flashing metal left in the joint. Make necessary repairs to the vertical surface and reflash in accordance with standard specifications for new roof construction. Provide new reglets as required. Where bituminous base flashings are provided, the cap flashing should extend down as close as practicable to the top of the cant strip. Where metal base flashings are provided, the cap flashing should overlap the metal base flashing at least 3 inches.

12.1.3.5 Repair Methods of Flashings When Repairs Involve Application of a New Membrane. If the existing roofing membrane is to be replaced, base flashings and cap or counter flashings should be removed. An exception may be made with the metal counter flashing that is in good condition, well fastened to the wall, and which will stand bending up for the application of new base flashing and bending down after base flashing is installed. Install new base flashing after repair membrane is applied in accordance with standard specifications for new roof construction. Install cant strips at intersection of roof with vertical surfaces. Cant strips should be attached to the deck and not to the wall. Replace metal base flashings with bituminous base flashings.

12.1.3.6 Repair Methods for Parapet Walls. It is poor practice to coat parapet or fire walls with an impervious coating. Moisture trapped within the masonry may result in spalling or deterioration.

12.1.3.6.1 Mortar Joints Deteriorated. To repair deteriorated mortar joints, rake out all loose mortar and repoint with a 1:1:6, portland cement, hydrated lime and sand mortar, proportioned by volume.

12.1.3.6.2 Joints in Coping Open. To repair open joints in the coping, rake out all loose material and repoint with portland cement or a suitable caulking compound.

12.1.4 Reroofing

When preparing projects for reroofing, careful attention must be given to the flashing design. Flashings must be fully detailed on the contract drawings. In recent years, many improved flashing designs and practices have been developed, particularly as regards built-up roofing. The reroofing project should incorporate the best flashing design possible. Well designed flashings properly installed will hold future maintenance and repair to a minimum. Much useful information on flashing can be found in the publications listed in appendix E.

Section II. VENT FLASHINGS (VENTILATORS, PLUMBING STACKS, ETC.)

12.2.1 General Discussion

The majority of vents are constructed of metal and consequently are subject to expansion and contraction. For this reason, it is poor practice to attempt to flash up the sides of such projections as this type of flashing is subject to early failure. Vents are usually of two types, the flat flange vent and the curb vent. The curb vent is the preferred type. The flat flange vent is placed directly upon the last ply of roofing while the curb vent is constructed to fit over a wooden or concrete curb. Each type is supplied with a component flashing flange by which the vent is connected to the roofing. In the case of the flange vent, asphalt plastic cement is used generously beneath and above the metal flashing flange which is securely nailed to the roof. The flange is stripped with two plies of felt, not less than double the width of the flange, cemented solidly together and to the flashing flange with asphalt, pitch or plastic cement. In the case of the curb vent, the base flashing is brought up and over the curb.

12.2.2 Failure—Vent Flashings

All vents and vent flashings should be carefully inspected during the periodic roof inspection and at such times that leaks are reported in the structure. An inspection should also be made from the underside of the roof. Damp areas or stains near the vent indicate a flashing failure, the common causes being:

(1) Broken seams caused by expansion and contraction.

(2) Exposed nails that have worked loose causing separation of metal flashing flange from roof (fig. 50).

(3) Omission of felt stripping over edge of flange.

(4) Standing water around vent.

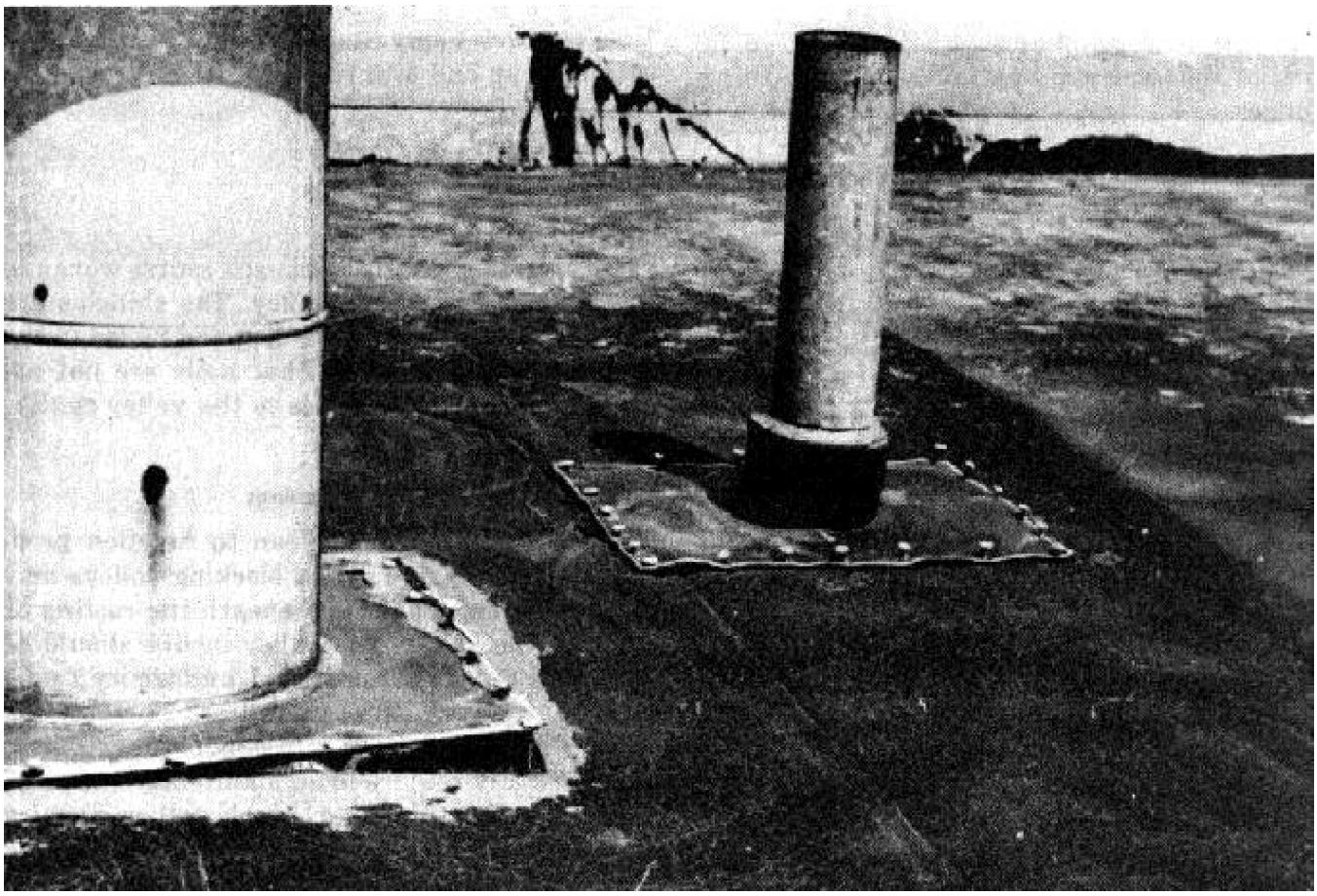

Figure 50. Improper installation of vent and stack flashings.

(5) Deterioration of metal caused by lack of a protective coating of paint.

12.2.3 Maintenance of Vent Flashings

12.2.3.1 Broken Seams Caused by Expansion and Contraction. When broken seams occur as a result of expansion and contraction, resolder broken seams and install additional expansion joints if necessary.

12.2.3.2 Separation of Flashing Flange From Roof Caused by Exposed Nails Working Loose. When exposed nails that hold a roofing flange to a roof work loose, raise flashing flange high enough to force plastic cement beneath it and redrive loose nails. Apply two piles of felt or fabric cemented to each other and to the flange and roofing membrane with asphalt, pitch, or plastic cement. The outer edge of the first ply of felt or fabric should extend not less than 3 inches beyond the flange and of the second ply of felt or fabric not less than 6 inches. Apply finished surfacing similar to roof surfacing.

12.2.3.3 Omission of *Felt Stripping Over Flashing Flange.* When the felt stripping over a flashing flange is omitted, treat edges by applying two layers of felt or fabric as described in preceding paragraph.

12.2.3.4 Standing Water Around Vent or Water Stains on Adjacent Roofing. (Treat only if leakage occurs). Remove old flashing and reflash in accordance with instruction given in paragraph 12.2.3.2 above. In severe cases reinstallation of the vent may be called for.

12.2.3.5 Lack of Protective Coating of Paint With or Without Deterioration of Metal. When the metal surface is not protected by paint, remove all rust, moisture, loose scale, grease, dirt, etc., and apply fresh application of paint. Instructions for painting metals are given in the tn-services paint manual. In cases where the metal is seriously deteriorated, removal and replacement with a new vent may be called for.

12.2.4 Repair of Metal Vents During Reroofing

When reroofing, metal vents and the flashing flanges should be carefully inspected for signs of deterioration. If deterioration is serious, remove old vent and install new vent in accordance with standard specifications for new roof construction. When the existing vent is deemed serviceable, proceed as follows:

(1) *Flange Vent.* If possible, remove the vent and reset on top of new membrane. If the flashing

flange is securely fastened to the old roof, the new membrane should be cut to fit around the vent and applied over the flashing flange.

(2) *Curb Vents.* Raise the vent. Install new flashing up and over the curb. Refasten vent to the curb.

Section III. VALLEY FLASHINGS

12.3.1 General Discussion

Roof valleys are formed when two sloping roof sections join to form a \/. Since water from both sections is concentrated in the valley, valleys are of extreme importance. Valley flashings on tile, slate, asbestos-cement shingles, wood shingles, metal and similar roofs are usually constructed of metal. Valley flashings for asphalt strip shingles may be metal type, mineral-surfaced asphalt roll roofing type, or woven asphalt strip shingles type. Valley flashings on mineral-surfaced asphalt roll roofing are constructed either of metal or mineral-surfaced roll roofing.

12.3.1.1 Metal Valley Flashings. Metal valley flashings may be of 20-ounce copper or similar material and are applied in sheets not exceeding 8 feet in length, free from longitudinal seams and of sufficient width to extend not less than 4 inches under the roof covering on each side. The exposed portion is approximately 4 inches wide at the top and increases 1 inch in width for each additional 8 feet in length. Each section is lapped not less than 6 inches (8 inches where the slope of the valley is less than 4½ inches per foot) in the direction of flow and the upper end is fastened to the roof deck. With slate or tile roofing, 24-ounce copper is generally used in place of the 20-ounce, and where valleys are installed with clay or cement tiles, the exposed valleys have a uniform width of 4 inches in place of the increasing width of 1 inch per 8 feet.

12.3.1.2 Mineral-Surfaced Asphalt Roll Roofing Valley Flashings. Mineral-surfaced asphalt roll roofing is satisfactory for flashing valleys of both asphalt-shingle and mineral-surfaced asphalt roll roofing roofs. The valley is lined with two thicknesses of the material. The first ply is 18 inches in width and centered in the valley with surfaced side down. The second ply, 36 inches in width, is applied over the first strip, centered into the valley, nailed and cemented with surfaced side up. The width of the valley is 6 to 8 inches wide at the top and will diverge at the rate of 1 inch per each 8 feet of the valley.

12.3.1.3 Woven Asphalt Strip Shingle Valley Flashings. In this type valley flashing, the full length of the valley is first lined with smooth-surfaced roll roofing 36 inches wide. The asphalt strip shingles are then applied on both roofs simultaneously with each course woven in turn to form a closed valley. The shingles are pressed tightly into the valley and nailed in the normal manner except that nails are not applied closer than 6 inches to the valley center-line.

12.3.2 Failure of Valley Flashings

Valleys must be kept clean to function properly. Ice dams and debris blocking valleys may cause water to back up beneath the roofing of laps of the valley. The valley incline should be checked for smoothness and uniformity to assure a rapid run-off of the water.

12.3.2.1 Metal Valleys. Copper valley flashings usually require little maintenance if properly installed. However, terne valleys require protective paint coatings, and galvanized iron should be painted when the first signs of rust appear. Separations at the end laps and openings in the metal resulting from corrosion are common failures.

12.3.2.2 Mineral-Surfaced Roll Roofing Valley Flashings. The inspector should look for signs of normal weathering which will most likely appear in this area first since water concentrates in the valley. The first indication is the loss of granules, slight at first, but accelerating as the loss of granules exposes more of the asphalt to the weather. Separation of end laps and separation of the roof propel from the valley flashings often result in leaks.

12.3.3 Maintenance and Repair

12.3.3.1 Metal Valley Flashings. Valleys must be kept clean to function properly.

12.3.3.1.1 Leakage Occurring at Laps. Do not attempt to solder laps. Treat seams or lap with a white lead paste consisting of basic lead carbonate and 8 percent boiled linseed oil.

12.3.3.1.2 Small Holes in Copper Flashings. Clean surface around hole with emery cloth, apply a flux of zinc chloride or resin and repair with a drop of solder.

12.3.3.1.3 Large Holes in Copper Flashings. Prepare surface as in paragraph 12.3.3.1.2 above and solder a piece of copper over the hole.

12.3.3.1.4 Holes in Galvanized Metal Flashings. Replace the smallest unit of the flashing.

12.3.3.1.5 Lack of Protective Coating of Paint on Terne or Galvanized Metal Valleys. Painting should never be put off until rust appears.

Should rust appear, remove all rust, moisture, loose scale, grease, dirt, etc., and apply new application of paint. Instructions for painting metals are given in the tn-services paint manual.

12.3.3.2 Mineral-Surfaced Roll Roofing Valley Flashings. Valley must be kept clean to function properly.

12.3.3.2.1 Loss of Granules Due to Normal Weathering and Water Concentrating in Valley. Remove all loose granules, dust, and dirt by sweeping, vacuuming or air blast and apply one thin coat, by brushing, of asphalt primer (55- A-701). After primer is dry, apply one of the following:

(1) A coating of asphalt emulsion (MIL-R-3472) by brush at a rate of 3 gallons per square.

(2) Asphalt base roof coating meeting Federal Specification SS-A-0694C, by brush, at a rate of 3 gallons per square.

12.3.3.2.2 Separation of End Laps. When end laps of roll roofing valley flashings have separated, lift upper lap high enough to force a liberal amount of plastic cement between plies and press top lap firmly in place.

12.3.3.2.3 Separation of Roofing or Shingles from Flashing. Gently lift separated shingle or area, force plastic cement beneath it, and press shingle or roofing firmly into the cement.

Section IV. DRAINAGE SYSTEMS

12.4.1 General Discussion

The drainage system includes all gutters, leaders, drains, scuppers, crickets, etc. The primary function of this system is to remove water from a roof as quickly as possible and to prevent the storage of water on the roof. Every roof must have some provision for drainage, including the so-called "dead level" decks. It is important that drainage areas be kept free from debris which will interfere with proper drainage (fig. 51). Many roof failures can be traced both directly and indirectly to

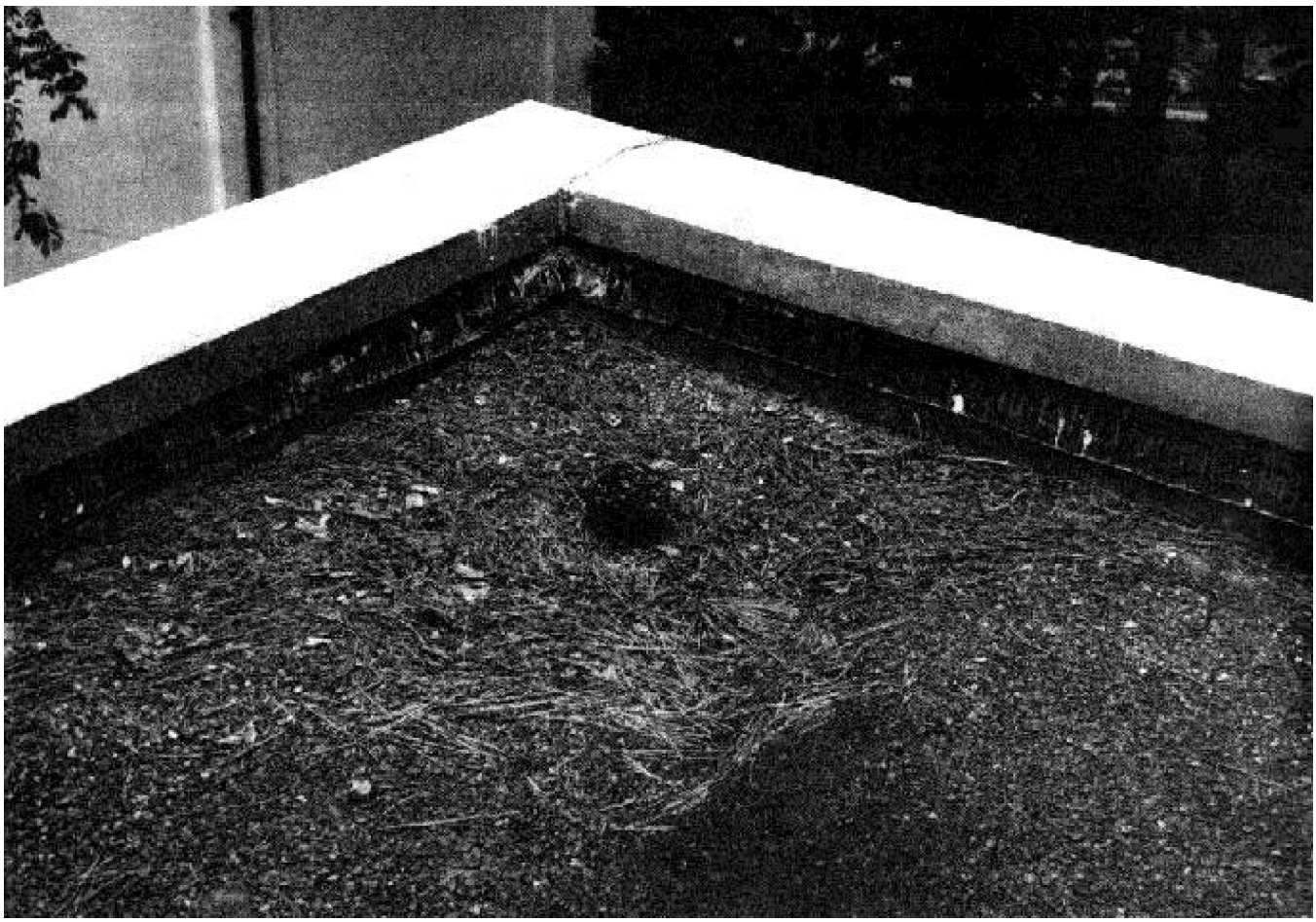

Figure 51. Debris on roof impedes drainage.

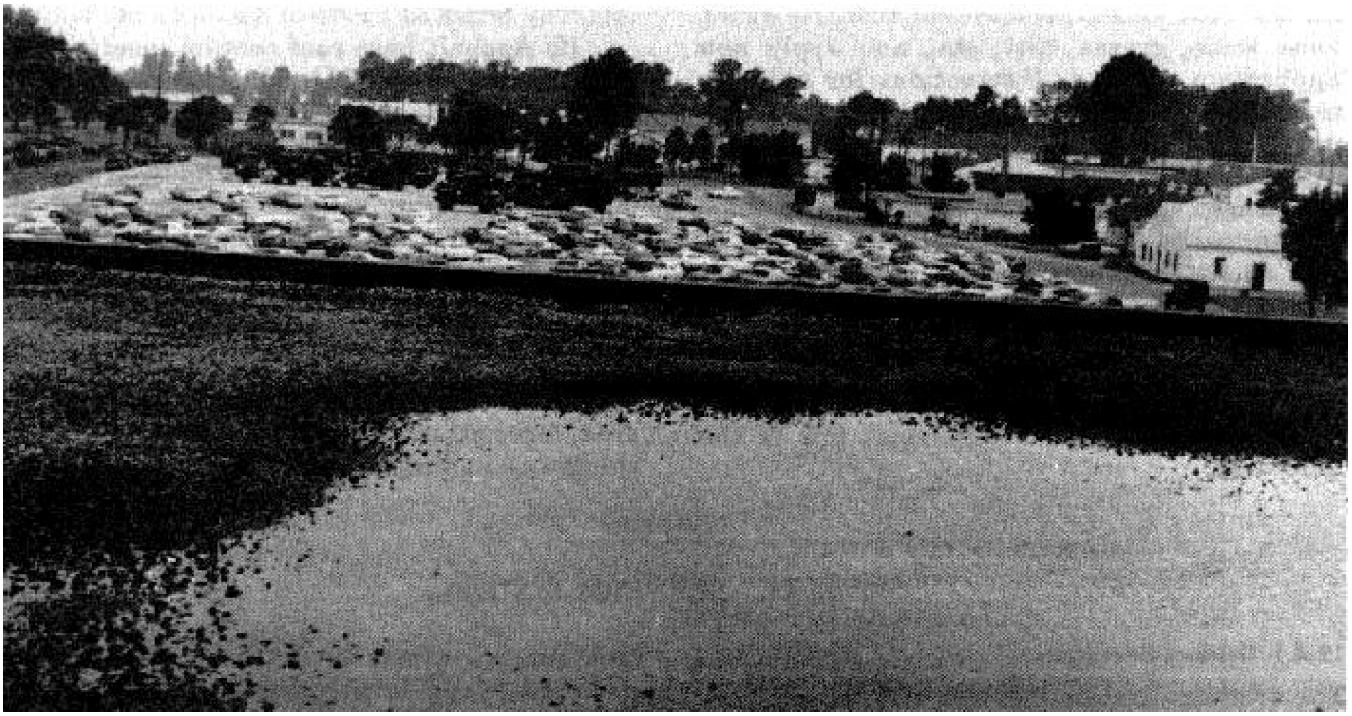

Figure 52. Drain not located in low area — ponding sometimes caused by structural defect.

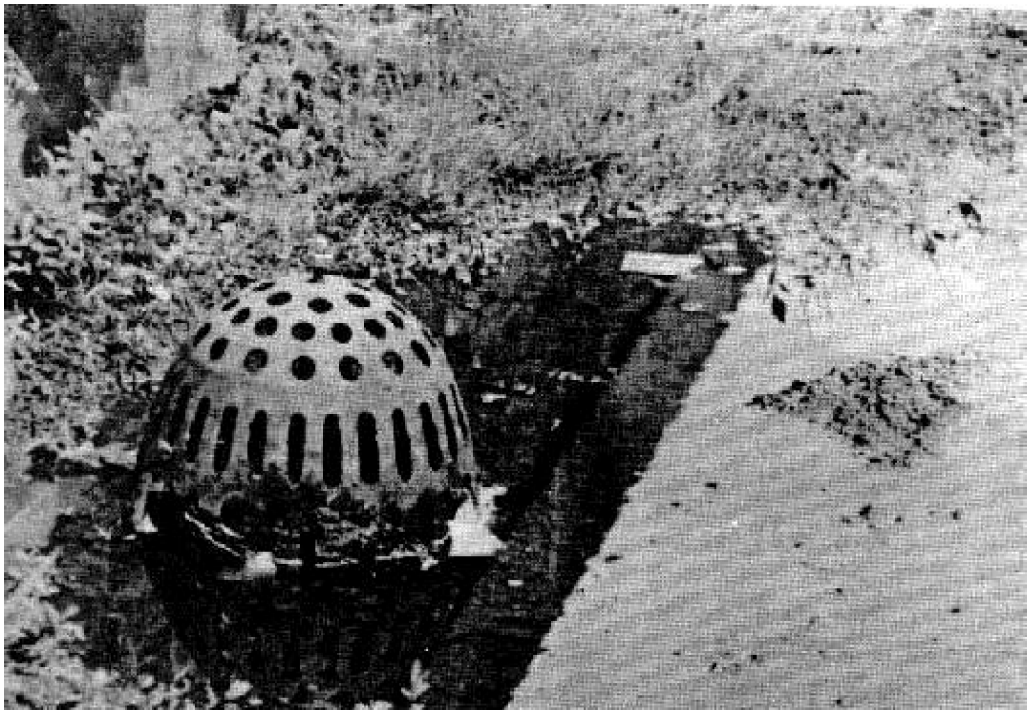

Figure 53. Clogged drains — drains must be kept clean to function properly.

inadequately designed or improperly installed drainage systems. Ponded water (fig. 52) may indicate structural defects.

12.4.2 Inspection

A suggested checklist for inspectors is as follows:

(1) Check deck incline. It should be smooth and uniform.

(2) Look for low areas. Standing water or water stains are signs of low areas.

(3) Check gutters, leaders, etc., for obstructions which will hinder the run-off of water.

(4) Check size, locations and number of drains, gutters and leaders.

(5) Look for broken or clogged drains.

(6) Look for standing water around drains.

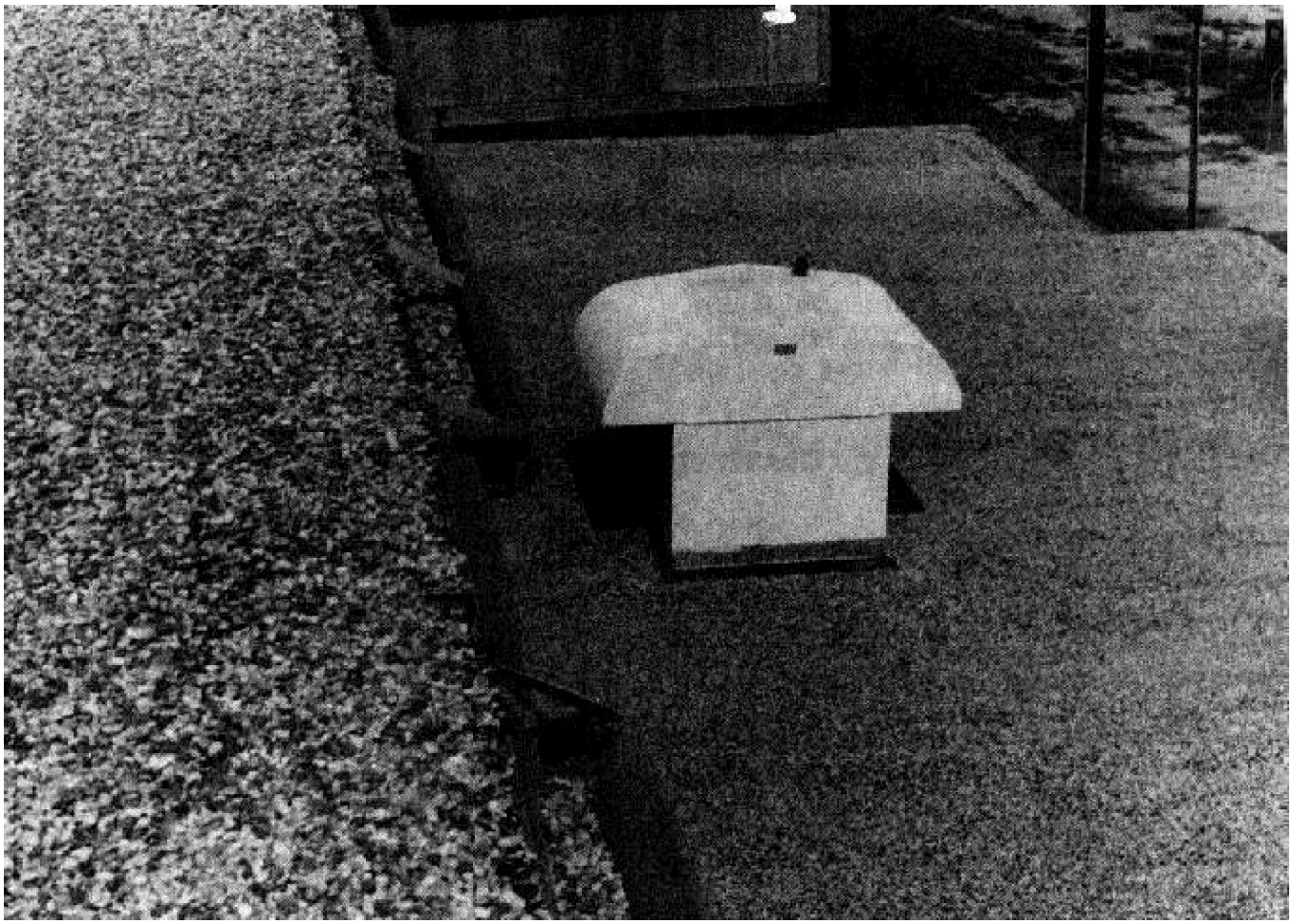

Figure 54. Accumulation of gravel causing collapse of gutter.

This indicates drain is set too high or not in correct location.

(7) Look for defective flashing around drains. Drains are usually equipped with a flashing flange which should be securely fastened to the roof deck and double felt stripped as in the case of vent flashings.

(8) Check gutters for defective hangars and straps. Check gutter for slope. Gutters should slope downward to the leader a minimum of 1/16 inch per foot of length.

(9) Check gutters for holes, rust, or other signs of deterioration.

12.4.3 Maintenance and Repair

12.4.3.1 Drains. Roof drains must be kept clean to function properly (fig. 53).

12.4.3.1.1 Broken Drains. Remove broken drain and install new drain in accordance with specifications for new roof construction.

12.4.3.1.2 Separation of Flashing Flange from Roof. If flashing flange is separated from roof, treat as described in paragraph 12.2.3.2.

12.4.3.1.3 Standing Water Around Drain. If drain is not clogged, standing water (so-called "bird baths") indicates drain is not at a low point of the area or is set too high. The drain should be lowered or relocated at a low point of the area.

12.4.3.2 Gutters and Leaders. Gutters and leaders must be kept clean to function properly. Remove all gravel, slag, dirt, leaves, or other debris (fig. 54).

12.4.3.2.1 Rusting or Corrosion of Gutters and Leaders.

(1) Metal not deteriorated: Remove all rust, moisture, loose scale, grease, dirt, etc., and apply new coat of paint. Instruction for painting metals are given in the tn-service paint manual. Inside surfaces of gutters may be painted with asphalt varnish.

(2) Metal severely deteriorated: Remove defective section and replace with new material in accordance with standard specifications for new roof construction.

12.4.3.2.2 Defective Straps and Hangers. Defective straps and hangers should be replaced and/or realined. Add new hangers or redesign hangers as required.

12.4.3.2.3 Gutters Overflowing. The engineer should check size and slope of gutters, and number and size of leaders for adequacy. If gutters and leaders are found deficient in capacity to carry off anticipated run-off, they should be replaced using increased sizes and slopes.

12.4.3.3 Low Areas, Permitting Water to Stand (fig. 52). Failures of this type are usually the result of poor design or structural failure. Building up the roof covering with felt and hot bitumen or any type of fill is not generally recommended since the materials only add weight to an already weakened area. Before repair or reroofing is started, the low area may sometimes be corrected by raising the sunken joists or installing new joists. Where raising joists or purlins is impractical, the placing of additional drains in the low area will serve to remove the weight of ponded water from the roof and lessen deterioration of the roofing membrane. Such would be the case where wood trusses, purlins, or other structural members have sagged.

Section V. GRAVEL STOPS AND METAL EDGING

12.5.1 General Discussion

The primary function of gravel stops (slag or gravel surfaced roofs) and metal edging (smooth-surfaced built-up roofs) is to finish off all exposed edges and eaves in order to prevent wind from getting under the edges causing blow-offs. Another important function of the gravel stop is to prevent the loss of gravel, slag, or bitumen from areas near the edge of the roof. The flashing flange of the gravel stop or edge strip is placed over the last ply of felt and should extend at least 4 inches on the roof. It should be embedded in roofing cement, nailed securely to the roof deck, and double felt stripped, after which the finished coat of bitumen and surfacing or cap sheet is applied. The lip of the gravel stop should protrude a minimum of ¾ inch above the roof deck while the lip of the metal edging should be a maximum of ½ inch above the deck. Both should be securely fastened to the facia board. Many structures have been observed where gravel stops or metal edging have been omitted. In lieu of this practice, the roofing membrane was bent over the edge and fastened to the facia board with wooden battens. Numerous failures or potential failures have occurred at these vital areas due to severe weathering of the roofing materials and to the deterioration of the wood battens and the facia boards which in turn renders the roof membrane susceptible to wind damage.

12.5.2 Inspection

The gravel stops and metal edging should be inspected during the annual inspection of the roof. The inspector should examine carefully the entire edge of the roof, paying particular attention to:

(1) Deteriorated gravel stops and metal edging (fig. 55).

(2) Damaged or rotted overhangs and facia boards.

(3) Separation of flashing flange from the roof.

(4) Bitumen flowing under gravel stop and down facia board.

(5) Omission of gravel stops and metal edging.

12.5.3 Maintenance and Repair

12.5.3.1 Deteriorated Gravel Stops and Metal Edging.

12.5.3.1.1 Not Seriously Deteriorated. Remove all rust, moisture, loose scale, grease, dirt, etc., and apply fresh coating of paint to ferrous metal. Instructions for painting ferrous metals are given in the tri-services paint manual.

12.5.3.1.2 Seriously Deteriorated. Remove and discard section containing deteriorated area and replace in accordance with standard specifications for new roof construction. Replace damaged overhang and facia boards as required.

12.5.3.2 Damaged, Rotten or Deteriorated Facia Boards and/or Overhangs. Remove and discard all deteriorated metal. Replace deteriorated facia boards and overhangs and install new gravel stop or metal edging in accordance with standard specifications for new roof construction.

12.5.3.3 Separation of Flashing Flange from Roof Membrane. When the flashing flange is separated from the roof membrane, scrape off gravel of slag at least 12 inches from gravel stop and lift flange high enough to force plastic cement beneath it. Renail in place on 3-inch centers and apply two layers of felt stripping, embedded in hot asphalt, the top one overlapping the lower one 2 to 3 inches. Pour hot bitumen over bare area and while hot, embed clean, dry slag or gravel as used for the roof.

12.5.3.4 Bitumen Flowing Beneath Gravel Stop and Down Facia Boards. This type of failure, more

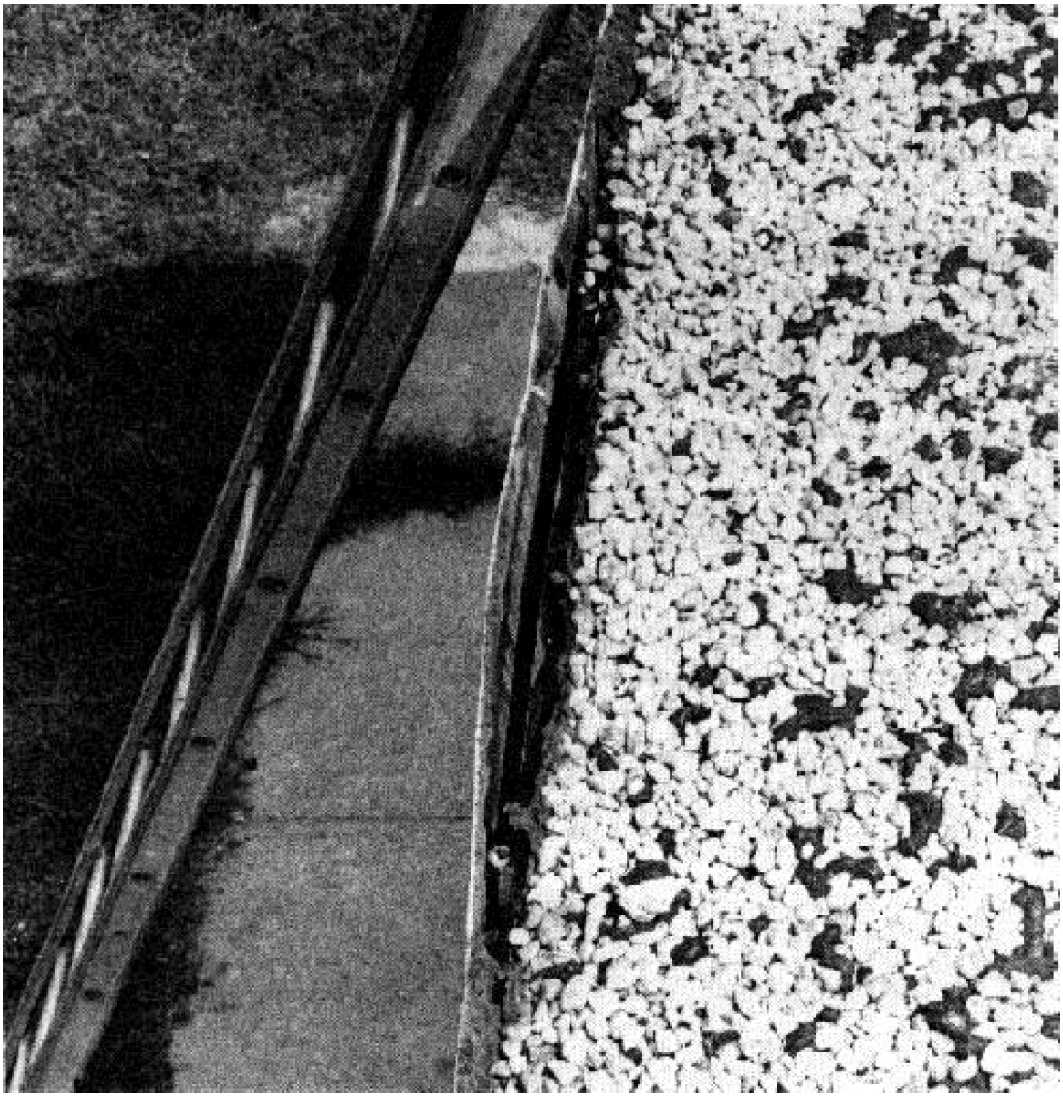

Figure 55. Deteriorated gravel stop.

common in the coal-tar pitch roof, is usually due to original design or construction and very little can be done to correct it after installation of the roof. However, it can be prevented by a simple means, by installing the roof as follows:

(1) Extend the first two plies of felt at least 6 inches beyond the edge of the roof.

(2) Cut the next 2 or 3 plies even with the edge.

(3) Turn the extension of the first two plies back and over the other plies forming an envelope.

(4) Install gravel stop in usual manner over this. Modifications of the above method or metal bitumen stops may also be used.

12.5.3.5 Omission of Metal Gravel Stop or Metal Edging. Areas where metal gravel stops and metal edging have been omitted should be inspected at frequent intervals (every 6 months) and at first indication of failure, gravel stops or metal edging should be installed in accordance with standard specifications for new roof construction. This will prevent costly blow-offs.

Section VI. OTHER PROJECTIONS

12.6.1 General Discussion

The projections included in this section are pipes, ladder struts, flag poles, bracings for signs, etc., which penetrate the roofing. No attempt should be made to flash around these projections with felts, as any expansion, contraction or other movement in these members will crack the felts and a leak will develop. On shingle-type roofings such projections should be flashed with a metal sleeve flashing with flange. On built-up roofs curb-type flashing is recommended for such projections. While pitch pockets are also used, their use should be avoided where possible.

12.6.2 Maintenance and Repair

To repair old felt flashings at projections, cut away the felt flashings and install a curb-type flashing, a metal sleeve flashing with flange, or a pitch pocket with flange. The flashing flange should be placed on the last ply of felt and securely nailed and cemented to it. The flange then should be stripped with two layers of felt, the top one overlapping the bottom one by 2 to 3 inches, and cemented with hot bitumen. In the case of the pitch pocket, the cup is fitted with hot bitumen. On wood decks, a layer of concrete, 1 inch in thickness, is poured in the pitch pocket and allowed to set prior to filling with the hot bitumen.

1 2.6.3 Reroofing

In reroofing, curb-type flashings should be provided to the extent feasible.